HEC-RAS 3.1.3
May 2005
Release Notes

Version 3.1.3 is an update to Version 3.1.2, released in April 2004. In January 2005, Microsoft released security update KB891711; this security patch was for Windows XP Service Pack 1 operating systems and it had the unfortunate effect of interrupting the computation process notification for HEC-RAS. The computations were performed correctly but the main program was not notified that the computations were complete.

Version 3.1.3 was created to fix the problems caused by KB891711, correct some known bugs in Version 3.1.2 and to incorporate some changes that allow HEC-RAS to run within a secure computing environment.

The installation package of Version 3.1.3 will not overwrite previous versions of HEC-RAS. Therefore, more than one version of HEC-RAS can be installed on the same computer.

This release also contains a Terms and Conditions for Use (TCU) statement that must be agreed to when installing the program and when the program is run for the first time (per user). This TCU has also been made available from the Help menu.

The following changes were made so that HEC-RAS can be more easily run within a secure computing environment:

1. Example Projects - The installation of Example Projects used to be done during the installation of the program. Now, the Example Projects are installed from within the HEC-RAS program. During installation an archive of the Example Projects is placed in the program application area (which is not available to limited access users). The first time the program is run, users will be asked (after the TCU agreement) if they want to install Example Projects. They can select a folder and the archived Example Projects will be expanded to their desired location. The installation of the Example Projects can also be done at any time from the main HEC-RAS window under the Help menu.

2. Backup files – HEC-RAS can automatically backup the current project at a user specified interval. The backup files in earlier versions were written to the HEC-RAS application directory (C:\Program Files\HEC ….), now they are written to the local project directory. (The program files directory is generally only accessible with administration privileges).

3. User Specified Default Project Folder – Users can customize a quick jump link to a Default Project Folder from the Program Setup menu (available from the main HEC-RAS window under the Options menu).

The following is a list of bugs that were found in Version 3.1.2 and fixed for Version 3.1.3:

1. Compute Window - Leaving the Compute window open between unsteady runs causes an error that reported that the "Output DSS File: does not exist." This bug has been fixed.

2. Breach Data - The data check on breach parameters allowed users to specify a breach starting time before the start of the simulation.

3. High Arch Culverts – The HEC-RAS user interface allowed users to enter a high arch span less than 20 feet wide (the culvert hydraulic coefficients for inlet control have not been generated for high arch culverts less than 20 feet wide). As a result, unreasonable properties for these arches were extrapolated off the culvert property tables. Therefore, the interface has been changed to not allow extrapolation of arch culvert properties.

4. Printing multiple tables – Printing multiple node specific tables of Culverts, Bridges, Inline and Lateral Weirs had a problem that made the table for the first River Station repeat rather than printing the next one in the list.

5. Storage Area Editor – There was a bug in the storage area editor that affected storage areas that were on the upstream or downstream end of a reach. When selecting these storage areas in the editor, the editor would display an error message and would not save any new data.

6. Groundwater interflow – Groundwater interflow was not properly computed for unsteady flow simulations.

7. Roughness k – When the hydraulic radius was computed to be less than 1 ft the Manning's n value was computed as if the hydraulic radius was 1 ft.

8. Restart File option with Dam Breach – The dam breach option would not breach properly when using the restart file option.

9. Momentum method at junctions – The momentum was not computed correctly at junctions when split flow optimization was turned on.

10. Culvert Flow - When critical depth for inlet control was computed to be greater than the barrel height, the culvert would assume outlet control regardless of flow depth in the culvert.

11. Encroachments – There was a problem with the encroachment data editor when the encroachment analysis did not start at the upstream end of a reach. Data could be entered and computations were performed correctly, but if users returned to the encroachment editor, the encroachment input data would be shifted to a different cross section.

12. DSS Boundary Conditions – Plotting with Specified Minimum and Ratio– The unsteady flow boundary condition editor allows users to specify a multiplication factor and minimum value. These values were used correctly in computations, but if the Plot button was clicked on the hydrograph editor, the ratio and minimum were not reflected in the plot.

13. General interface improvements – Some misspelled words were corrected and various messages were reworded to improve clarity.

The following is a list of bugs that were found in Version 3.1.1 and fixed for Version 3.1.2:

1. Cross Section Editor – Menu Delete. Selecting "Delete" from the edit menu caused the program to crash.

2. Pump Station Editor. When setting a connection "from", "to" or "reference" to a RS, the text would say "Between RS:xxx and yyy", only the first RS should have been shown.

3. Lateral Weir Editor. When setting a connection to a RS, the text would say "Between RS:xxx and" and then skip the lower cross section.

4. Pier Debris. The pier editor had a button that would turn on and set the pier debris for all the piers. This has been modified to have another button to turn pier debris off for all piers.

5. Gate Editor. Rename option changed the name in the geometry but not in the steady flow data.

6. Elevation Controlled Gates. The data checking for elevation controlled gates erroneously stated that the reference could not be found.

7. Gate Group Settings for Storage Area Connections. If there were multiple sets of gate groups, the program would incorrectly use the first set of gate group opening data for all the gate groups.

8. Geometric Schematic Cross Sections. The cross sections generated when no GIS data was entered were scaled incorrectly. A factor of 1/2 was applied to the left and right segments, making the cross sections 1/2 as wide as they should have been.

9. Geometric Schematic – Editing XS Schematic Lines. On the Geometric Editor from the XS Schematic Lines editor. Selecting a reach without any cross sections caused the program to crash.

10. Profile plot (and Fixed Sediment, and Pilot Channels) had a problem with a bridge that does not have any deck data.

11. General Profile Plot – Copying to the Clipboard. The general profile plot crashed the program when selecting copy table with headers to the clipboard.

12. General Profile Plot – Creating User Defined Plots. The user has the capability to create user defined plots, but the information was not saved for the next session of RAS.

13. General Profile Plot – Viewing Multiple Reaches. The general profile plot had an error when viewing multiple reaches.

14. Pump Station Profile Table - The profile table for pumps did not work. It has been fixed.

15. HEC-RAS Server Functions. Using Ras as a server had a bug with the Output_GetNode function. Use the Output_GetNodes routine instead.

16. Measured Rating Curves. Measured rating curves did not always plot on the stage flow plot with the rating curve tab.

17. SI Units on Breach Parameters. The threshold water surface for breaching was not converted from SI to US Customary units.

18. SI Units - Flow roughness change factors. The flow roughness change factors in the geometry did not work for data sets in SI units.

19. SI Units – Lateral diversion rating curves. There was a bug in conversion of the lateral diversion rating curves from one unit system to another. This probably would not have run SI.

20. Cross Section Specific Output Table. When looking at internal bridge sections, i.e. BR U and BR D, the downstream internal cross section (BR D) was displayed when asking for BR U.

21. Multiple Locations for Initial Conditions. The Internal initial stages editor for unsteady flow was modified to include a button for adding multiple river stations at one time.

22. Export to HEC-DSS Outflow-Flow. The order of the paired data was switched to comply with HMS.

23. UNET Import. WD records from a UNET file were not imported correctly in version 3.1.1 (and earlier) .

24. HEC-2 Importer. The HEC-2 importer from Main RAS Menu crashed RAS when there was no flow data.

25. Geometry Import. If data was imported from an existing HEC-RAS project, the junction lengths were skipped, this oversight has been corrected.

26. Encroachments. There was a bug in 3.1.1 and all previous versions that would shift the encroachment information to the wrong cross sections if the encroachments in all profiles did not start at the same river station.

The following is a list of bugs that were found in Version 3.1 and fixed for Version 3.1.1 (May 2003):

1. Mixed Flow Regime in Unsteady Flow. If a bridge or culvert is included in a project to run in unsteady mixed flow regime, HEC-RAS will get stuck in an infinite loop.

2. Previous Versions of HEC-RAS Opened With HEC-RAS 3.1. If a project created in an earlier version of HEC-RAS is opened up in HEC-RAS 3.1, some of the output features may not work correctly until that project is rerun in HEC-RAS 3.1.

3. Unsteady Flow Output Intervals. For unsteady flow, an output time interval longer than a day (i.e. week, or month) for the detailed output interval, or hydrograph output interval, causes an error.

4. Multiple Profiles for Sediment Transport Capacity. In the sediment transport capacity computations, only the first selected profile computes correctly. Workaround: To look at more than one profile in version 3.1, the user should select only one profile per sediment reach. Perform the computations. Then select a new profile and perform the computations again. This must be done for each profile.

5. Stable Channel Design/Tractive Force Method – d50 and d75. In the Tractive force method for stable channel design, the message bar indicates that d50 and d75 should be entered in ft or

m, depending on the unit system being used. The value entered here should be in millimeters (mm), for both unit systems.

6. Unit Conversion for Hydraulic Design Data. For unit conversion, the uniform flow, stable channel design, and sediment transport capacity input/output boxes do not get converted properly (if at all). Input for sediment transport capacity may be lost in the conversion process. The unit conversion works fine for the bridge scour data.

7. Array Out of Bounds Error While Opening Certain Windows. Several new editors will produce an array out of bounds error when opened for a second time (if data was entered/edited the first time) during the same RAS session. The following tables had the error: Geometry - Node Name Table, Node Description Table, Picture File Association Table; Unsteady Flow – Encroachments. The data is there and has been saved. As a painful workaround, a user could open the editors, enter data, save project, close RAS, and then open it again.

8. Multiple Manning's n values for Culverts. If two different n values are used in a culvert, the bottom n value is ignored in the computations. The old method of compositing n values in culverts should be used until this has been fixed.

9. Pump Stations. A data set that has a pump station, but not a storage area, may cause the program to crash. Adding a dummy storage area will fix the problem.

10. Bridge Energy Method for High Flows. A bridge that has flow over the road and uses the energy only method (or defaults to energy only) may get bad results. The overbank area above the roadway may not be computed correctly. Program was underestimating the area, thus the computed water surfaces were coming out too high. This does not occur for all data sets.

11. Velocity Correction Factor for Momentum. For unsteady flow analysis: The internal boundary rating curves (e.g. bridges and culverts) did not have the beta momentum correction factor applied. This is most significant for internal openings that have a high channel velocity combined with a large overbank area. With the beta factor correctly applied, these bridges will tend to have a higher water surface.

12. Stable Channel Design. In the Stable Channel Design editor, Copeland's Method, the user-selected default regime is forced to Lower, regardless if the user selects Upper.

13. Sediment Transport Capacity Report. In the Sediment Transport Capacity calculations, if one or more of the sub sections (CH, LOB, ROB) do not have sediment gradation curve input, there may be problems generating the report. However, the computations are fine.

14. Pier and Abutment Scour. In the Bridge Scour Routines, the total scour value for each pier always includes the contraction scour for the location of the left abutment toe, regardless of where the pier is. This has been fixed so that the contraction scour for the appropriate subsection (LOB, CH, ROB) is included in the total scour computations. Also for pier scour, the K4 coefficient doesn't update correctly. To get the correct K4 value, enter the d90 value in feet, not mm.

15. Culvert Flow Threw Lateral Structures. For both Steady flow and Unsteady flow, a lateral structure that has multiple culverts in a single culvert group will compute too much flow. If every culvert is put in its own, separate culvert group, the flow is computed correctly.

16. Contraction Scour. The critical velocity computed for contraction scour is incorrect. To get the correct value, multiply the value reported in RAS version 3.1 by $(d50^{-0.667})$. This result may have an effect on whether Laursen's Live-Bed or Clear-Water scour equation is used.

17. Lateral Weir Computations. There is an error [usually small] in the computation of flow over the lateral weir. This error would be most significant when there is large change in water surface along the length of the weir (parallel to the river) and there is a large distance between the end of the weir and the adjacent cross section (for instance, if the distance to the upstream cross section is hundreds of feet).

18. Hotstart file. Using the hotstart option may cause the program to hang when it goes to do the DSS writes.

19. Report Generator. The Report Generator only provides output for the first profile, even if multiple profiles are selected.

20. Low Flow Methods at Bridges. If none of the user-selected bridge methods include energy, then there is a potential bug that may happen if none of the selected methods are valid. For instance, if Yarnell is the only low flow method selected and the program disregards the Yarnell answer (e.g. if it computes an upstream energy lower than the downstream energy), then the program will no longer default to the energy method. Instead, it will try to compute a pressure or pressure/weir answer, even if the water surface is not high enough for pressure flow. An interim fix to this problem is to turn on the energy method for all low flow solutions, in addition to other methods that you may feel are appropriate.

21. Sediment Transport Capacity Plots. If working in SI units, the sediment transport capacity profile plot will plot channel lengths (x axis) in US Customary units.

22. Sediment Transport Capacity Reports. If the number of particle sizes entered are different between the left overbank, main channel, and/or right overbank, a run time error will occur if the Report button is clicked.

23. Uniform Flow and Stable Channel Functions. A run-time error occurs if the user presses the Copy XS to Geometric Data when there is not a geometry file opened with at least one river and one reach.

24. Friction Loss Method at bridges for preprocessing. The default friction loss method, for the preprocessor bridge curves, has been changed from average friction slope to average conveyance. Average conveyance generally produces better results when there are large changes in friction slope between adjacent cross sections, which frequently happens during bridge contraction and expansion. The previous default method would, on occasion, compute unrealistically large friction losses, particularly if the cross section(s) immediately outside the bridge was a long distance from the bridge face.

25. Renaming a Project. When renaming a project, if the unsteady flow simulation editor was opened, then the output DSS file reference was not changed to the new project name.

26. Viewing Internal Bridge Sections. Looking at the internal sections for a bridge with more than 500 points causes and error.

27. Setting Schematic Extents. The Set Schematic Extents option did not produce appropriate Computed Extents if the geometry contained only background images.

28. Error in Opening Editors. Several editors will produce an array out of bounds error when opened for a second time (if data was entered/edited the first time). The following tables had the error:

      a. Geometry - Node Name Table, Node Description Table, Picture File Association Table
      b. Unsteady Flow - Encroachments

The data is there and has been saved. As a painful workaround, a user could open the editors, enter data, save project, close RAS, and then open it again.

29. Node Specific Output Table. On the Node Specific Output Table with Multiple Openings, the bridges and culverts from inside a multiple opening were in the RS list but did not show the correct output. These should be viewed with the menu type Multiple Opening.

30. Seasonal/Flow Adjustment to n-values. If a plan is for unsteady and it has seasonal or flow adjustments to Manning's n values, then when computing, the plan is converted to a steady flow plan, and SNET crashes.

31. Schematic Reach Lines. If a schematic reach line has a redundant first point, the creation of XS cut lines will fail.

32. Reload Profile Plot. If the profile table is opened when a new plan was made and the reload button is pressed, the program crashes.

33. Flow Minimum and Multiplier. RAS does not apply the flow minimum and multiplier to unsteady flow hydrographs for the initial conditions.

34. Hydrograph Volume. The computation of a hydrographs volume is incorrectly calculated in the stage/flow plotter. It is in error by the fraction 42560/43560.

35. Groundwater Interflow Parameters. There is no automatic data-save when the Darcy K and Distance parameters are changed.

36. Cross Section Points Filtering. The filtering option that removed points based on their area change contribution sometimes takes out the bank stations and changes in Manning's n.

37. Culvert Blockage. Unit conversion does not take place for Depth to Use Bottom n Value and Depth Blocked.

38. Printing Report Generator. The report generator in the printing of detailed tables prints only the first profile.

39. Cross Section Interpolation. In certain situations, the interpolator computed the wrong number of cross sections to interpolate, and as a result, the cross sections were closer together than they should be.

40. Run Multiple Plans. The Run multiple Plans option does not work if the computations were stopped by a user. The program has to be restarted before the Run Multiple will work again.

41. DSS Viewer. On the DSS Viewer, if the first row is selected, and then one of the filters is used, the first row will be blue, but not selected. When the Add Selected ... button is pushed, the first row does not go down to the lower list box.

42. Bridge Blocked Obstruction. The profile plot does not take blocked obstructions into account when computing the top of a bridge opening.

43. Splitting Reaches. When reaches are split, the unsteady boundary conditions are not moved.

44.HTAB file. Writing the HTAB file fails if a bounding cross section for a bridge was interpolated.

45. Cross Section Editor. If the cross section plot is turned off, the window is then maximized and then the plot is turned back on, the program terminates with a run-time error.

46. Import of Volume Elevations from GIS. The import of volume elevations from the GIS format converts with the wrong factor to acres (it uses 42560 instead of 43560).

47. HTAB Output Display Conversion. The top width data for HTAB curves is not converted to m in the output display.

48. Dam Breaching in SI Units. Breaching in SI units does not work.

49. Flow Minimum in SI Units. Flow minimum in SI units does not work.